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Modeling Authenticity

slide 1 This presentation shows the conceptual model of authenticity (expressed using UML notation) and provides an essential data dictionary.

slide 2 The developed conceptual model describes authenticity as a process with a dynamic profile and whose aim is to gather, protect and/or evaluate information mainly regarding identity and integrity.
The protection and assessment of the authenticity of digital object is a process too and specific procedures to be followed have been defined in order to manage it.
Each one of these procedures is called Authenticity Protocol (AP).

slide 3 An AP is a set of interrelated Authenticity Steps (AS).
An AP is applied to an Object Type (i.e. to a class of objects with uniform features for the application of an AP) and any AP may be recursively used to design other APs (the general *Workflow* relation expresses this recursion).

slide 4 Every AS models a part of an AP that can be executed independently as a whole, and constitutes a significant phase of the AP from the authenticity assessment point of view. The relationships between the steps of an AP (the set of required relationships is simply denoted as *Workflow*) establish the order in which the steps must be executed in the context of the execution of the protocol.

slide 5 An AS is performed by an Actor Type, that is a class of either human or non-human agents instantiated through the Actor Occurrence class.
The Actor Type is a generalization of both Automatic Actor (a hardware/software that performs tasks in an automatic way) and Manual Actor (i.e. human intervention).

slide 6 There can be several types of ASs which, according to OAIS, are distinguished based on the kind of Preservation Description Information (PDI) required to carry out the AS. So, analogously to PDI, four types of steps are possible concerning: Reference, Provenance, Fixity and Context respectively.

slide 7 Since an AS involves decision making, it is expected to ‘contain’ at least information regarding: good practices, methodologies, any kind of regulations that must be followed or can help in the analysis and, if possible, the criteria that must be satisfied in the evaluation.

slide 8 The execution of an AP is carried out by an actor on objects belonging to a

specific typology and is modelled as an Authenticity Protocol Execution (APE).
An APE (related to an AP via the *ExecutionOf* association) consists of a number of Authenticity Step Executions (ASE) (each in turn analogously related to the AS).
Every ASE is executed by an Actor Occurrence (an instantiation of the Actor Type) and contains information concerning the execution, including: the actor who carried out the execution; the information which was used; the time, place and context of execution.

slide 9 Different types of ASEs have different structures, and the outcomes of the executions must be documented in order to gather information related to specific aspects of the object (e.g. title, extent, dates and transformations).
An Authenticity Step Execution Report documents that the AS has been carried out (this is expressed by the *DocumentedBy* relation) and collects all the values associated with the data elements analysed in a specific ASE.

slide 10 The report provides a complete set of information upon which an entitled actor (either manually or automatically by means of a metric) can build an Authenticity Protocol Execution Evaluation which states an appraisal of the resource's authenticity, referring to both the identity and the integrity profile.

slide 11 As explained above, the authenticity, due to its dynamic profile, must be monitored continuously and any time a resource is somehow changed or a relationship is modified, an AP should be activated and executed in order to verify the permanence of the resources relevant features that guarantee its authenticity.
Any event impacting on a resource should trigger the execution of an adequate APE (as it is cleared up by the *TtriggeredBy* relation).
An Event Occurrence is an instantiation of an Event Type which identifies any act and/or fact related to a specific AP.

slide 12 The authenticity of a resource is strongly related to the criteria and procedures adopted to analyse and evaluate it.
The evolution in time of an AP should be documented in an Authenticity Protocol History. This evolution may concern the addition, removal or modification of any step making up the AP, and the change in the sequence defining the *Workflow*. In any case both the old and the new step and/or sequence must be retained for documentation.
When an AS of an AP is changed, all the execution of the AP that includes an ASE related to the changed step, must be revised and a new execution is required for the new (modified) step.

slide 13 Summing up the concepts explained above, it is possible to obtain the overall authenticity model. This model, in a sense, is founded on the concept of AP that is a process designed to assess the authenticity of a resource.

slide 14 (This and the following slides provide the definition of some fundamental concepts on which the model is based).

This model has been studied and analyzed by the partners of the CASPAR project (mainly by IBM and IRCAM) which have developed testbeds and ascertained that the general model can be applied to specific domains and specific components, also thanks to the instruments and tools which have been created by these partners and that are able to cover the general concepts explained above.
The implementation and the presentation of these experiences are shown in the videos recorded by the partners, which are available on the website of the project.